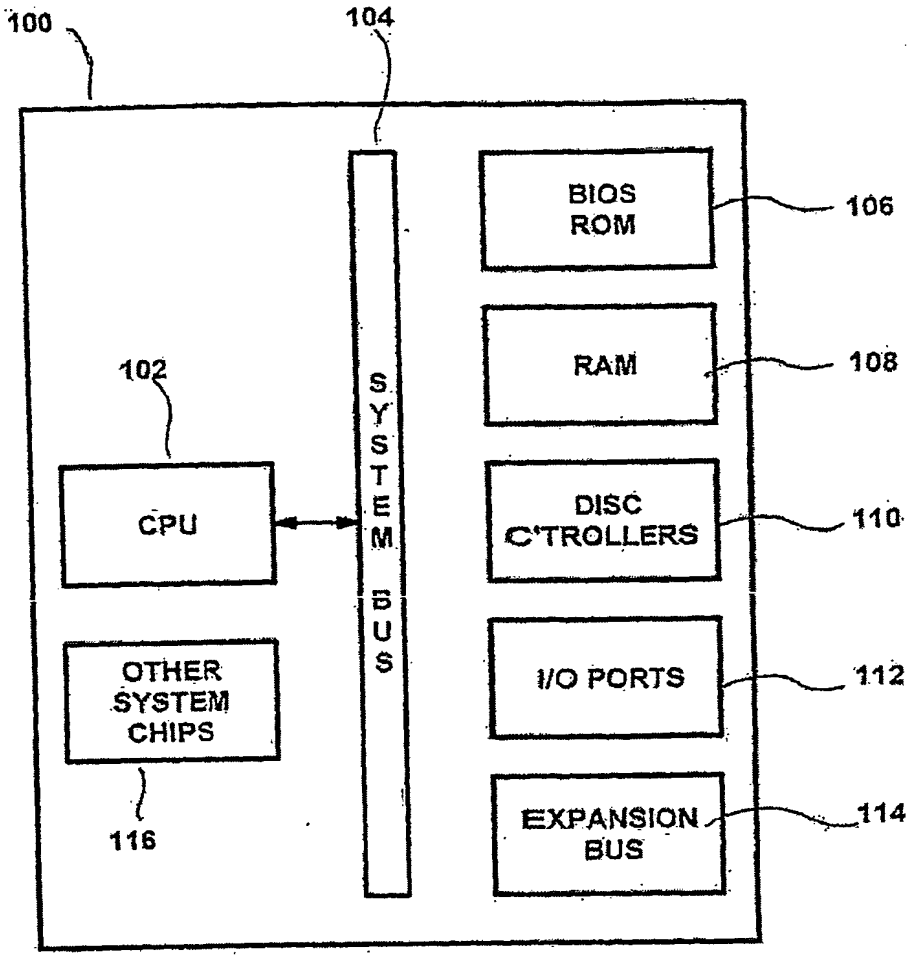

100
104
BIOS ROM
106
RAM
108
102
SYSTEM BUS
CPU
DISC C'TROLLERS
110
OTHER SYSTEM CHIPS
I/O PORTS
112
EXPANSION BUS
114
116

FIG. 1

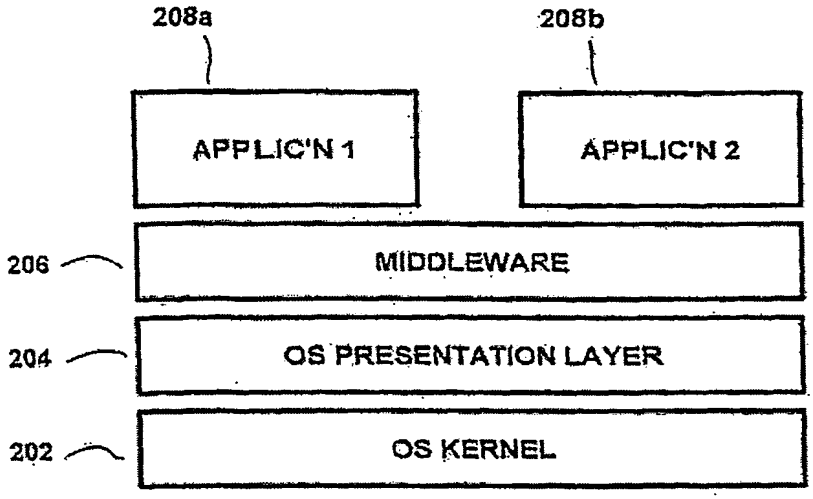

208a
208b
APPLIC'N 1
APPLIC'N 2
206
MIDDLEWARE
204
OS PRESENTATION LAYER
202
OS KERNEL

FIG. 2a

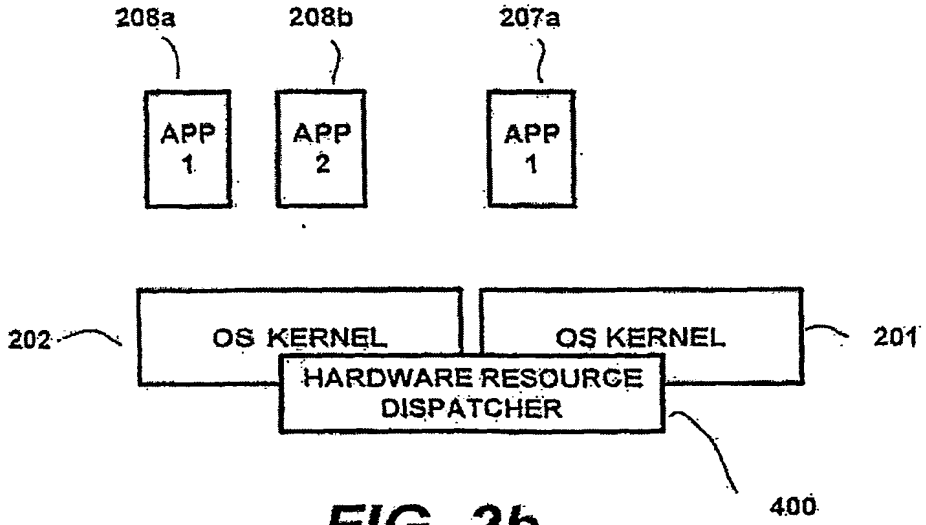
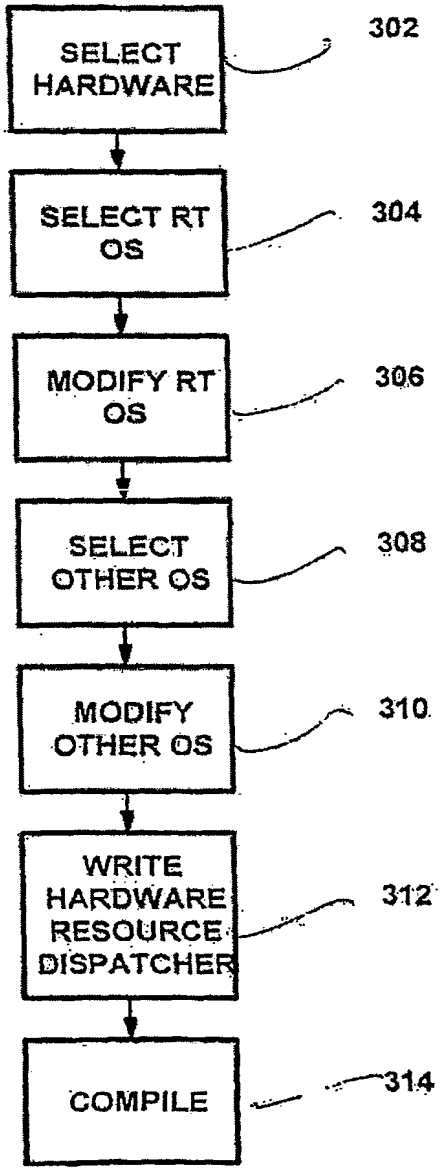

208a
208b
207a
APP 1
APP 2
APP 1
202
OS KERNEL
OS KERNEL
201
HARDWARE RESOURCE DISPATCHER
400

FIG. 2b

FIG. 3


SELECT HARDWARE
302
SELECT RT OS
304
MODIFY RT OS
306
SELECT OTHER OS
308
MODIFY OTHER OS
310
WRITE HARDWARE RESOURCE DISPATCHER
312
COMPILE
314

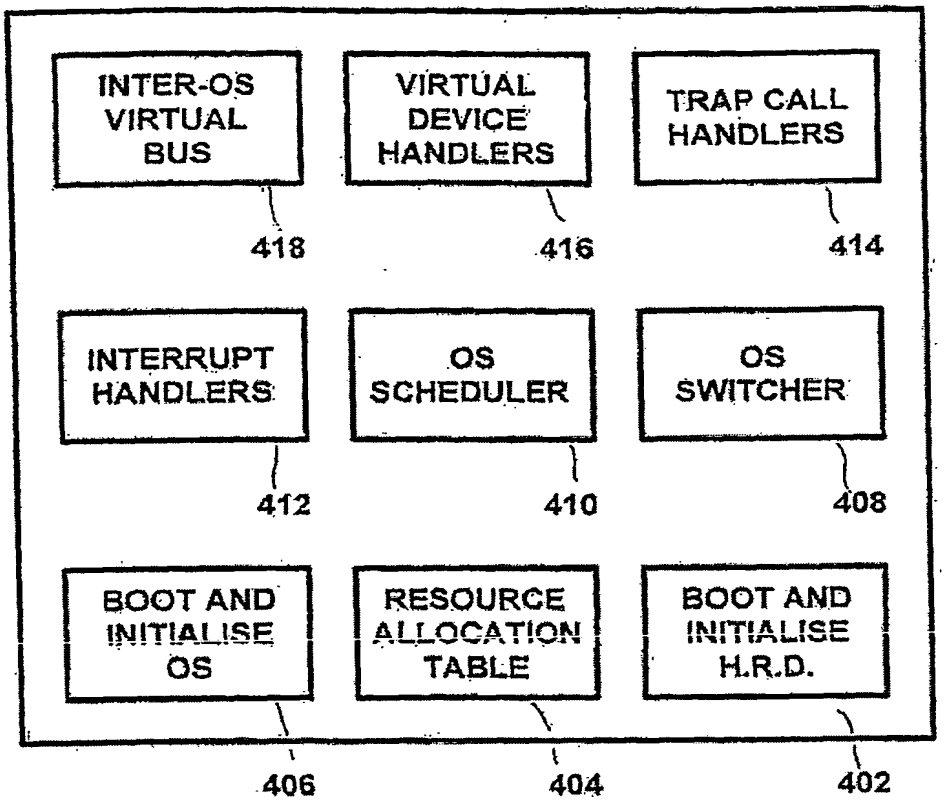

INTER-OS VIRTUAL BUS
VIRTUAL DEVICE HANDLERS
TRAP CALL HANDLERS
418
416
414
INTERRUPT HANDLERS
OS SCHEDULER
OS SWITCHER
412
410
408
BOOT AND INITIALISE OS
RESOURCE ALLOCATION TABLE
BOOT AND INITIALISE H.R.D.
406
404
402

FIG. 4

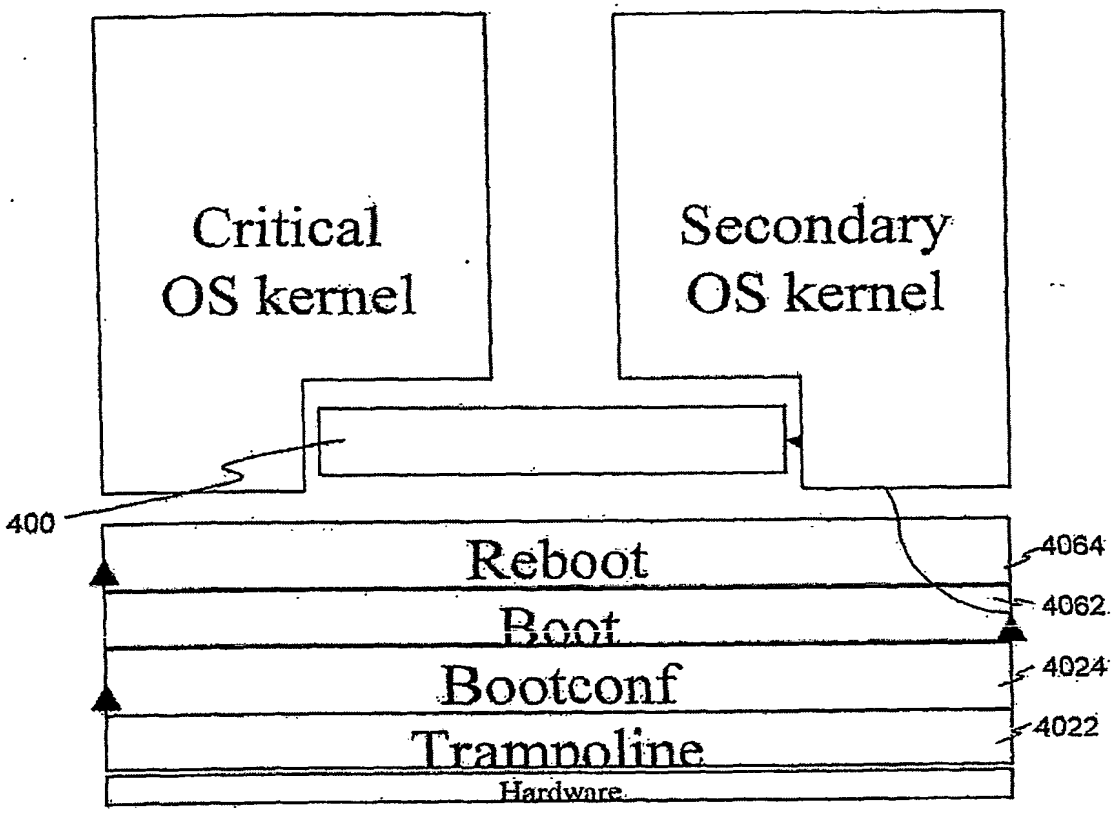

Critical
OS kernel
Secondary
OS kernel
400
Reboot
Boot
Bootconf
Trampoline
Hardware
4064
4062
4024
4022

FIG. 5

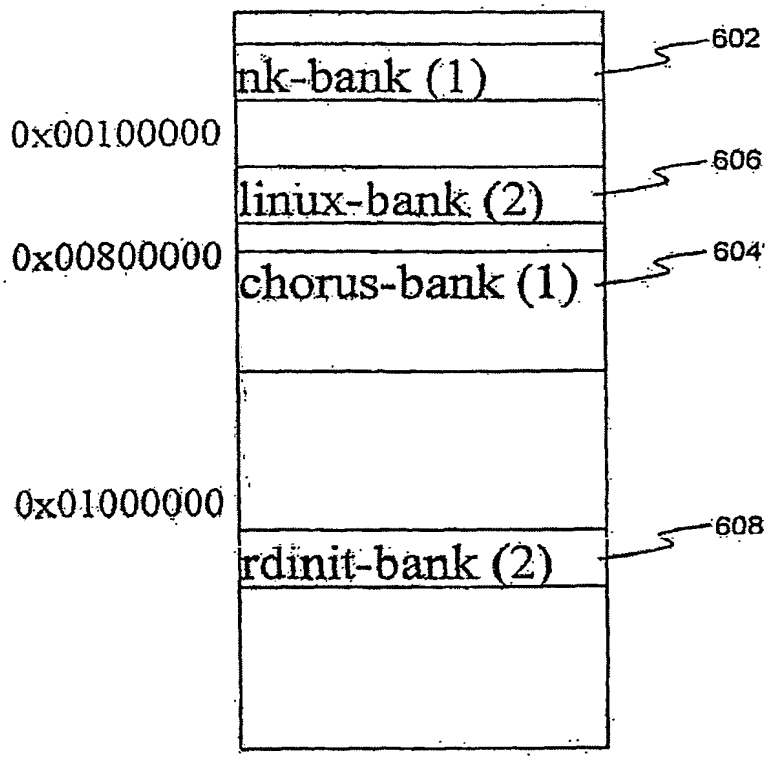

nk-bank (1)
602
0x00100000
linux-bank (2)
606
0x00800000
chorus-bank (1)
604
0x01000000
rdinit-bank (2)
608

FIG. 6

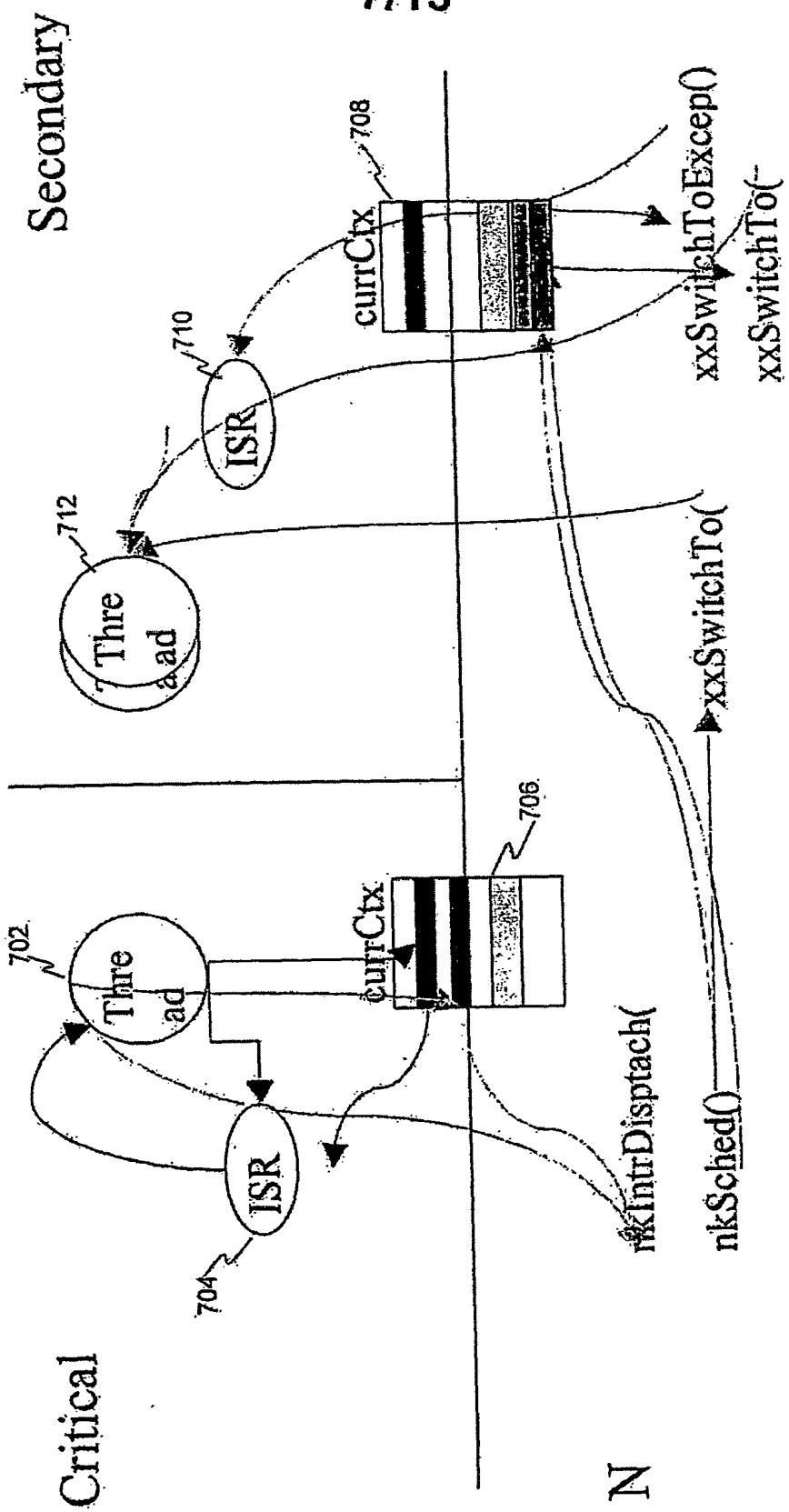

Secondary
Critical
N
Thre ad
ISR
currCtx
xxSwitchTo(
xxSwitchToExcep()
nkSched()
nkIntrDisptach(
702
704
706
708
710
712

FIG. 7

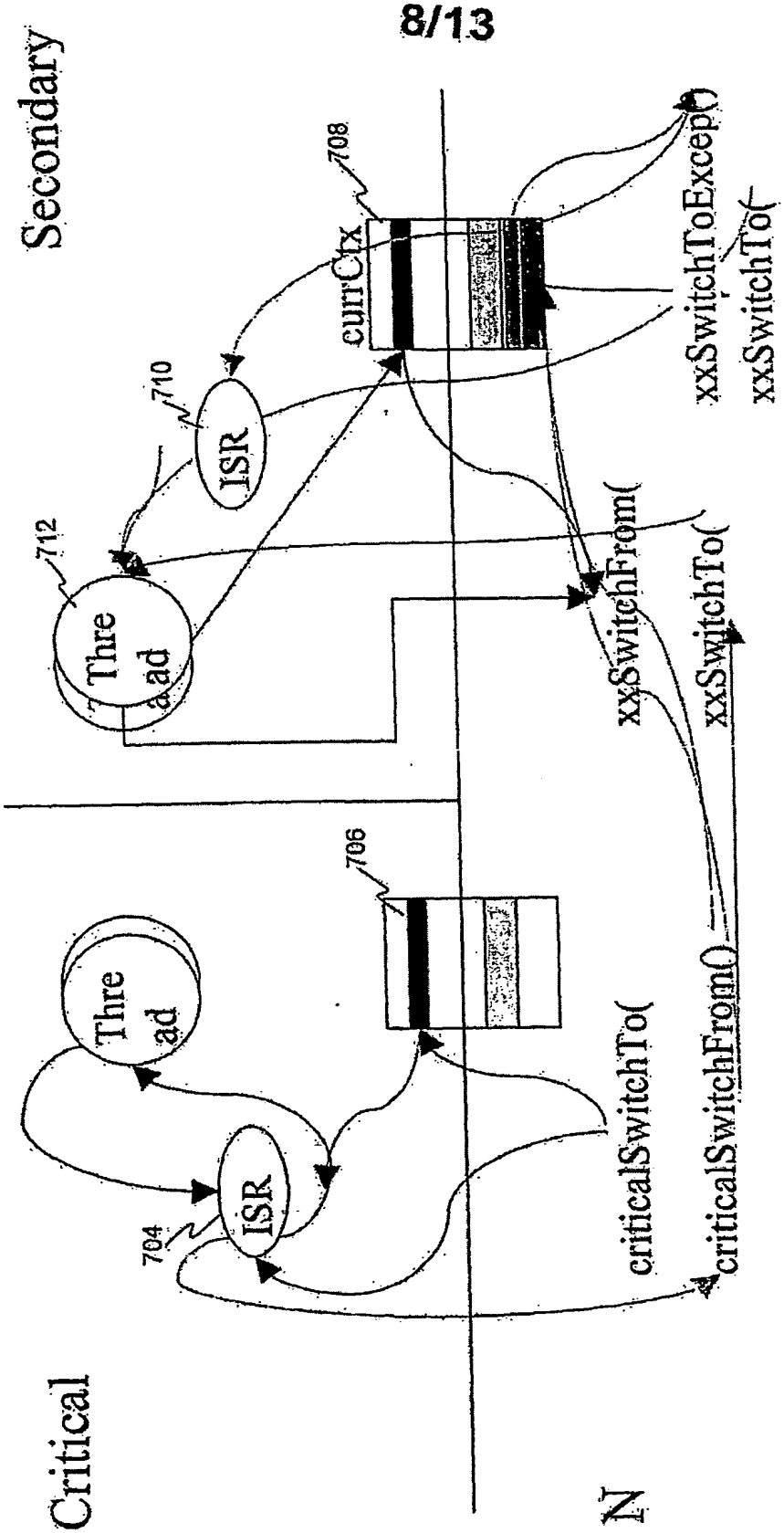

Secondary
Critical
N
Thre ad
ISR
704
706
710
712
708
currCtx
xxSwitchToExcep()
xxSwitchTo(
xxSwitchFrom(
xxSwitchTo(
criticalSwitchTo(
criticalSwitchFrom()

FIG. 8

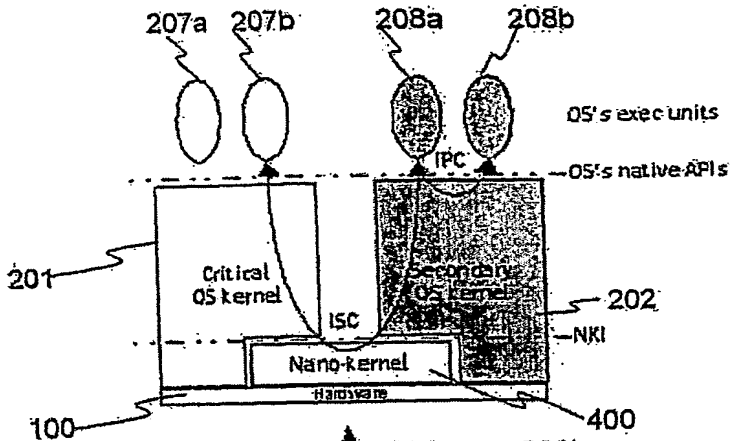

207a
207b
208a
208b
OS's exec units
IPC
OS's native APIs
201
Critical OS kernel
ISC
Secondary OS kernel
202
NKI
Nano-kernel
Hardware
100
400

FIG. 9a

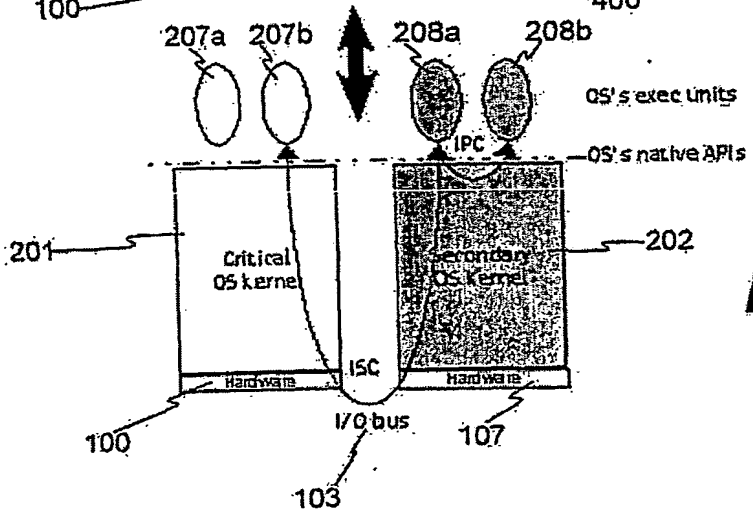

207a
207b
208a
208b
OS's exec units
IPC
OS's native APIs
201
Critical OS kernel
202
Secondary OS kernel
ISC
Hardware
Hardware
100
I/O bus
107
103

FIG. 9b

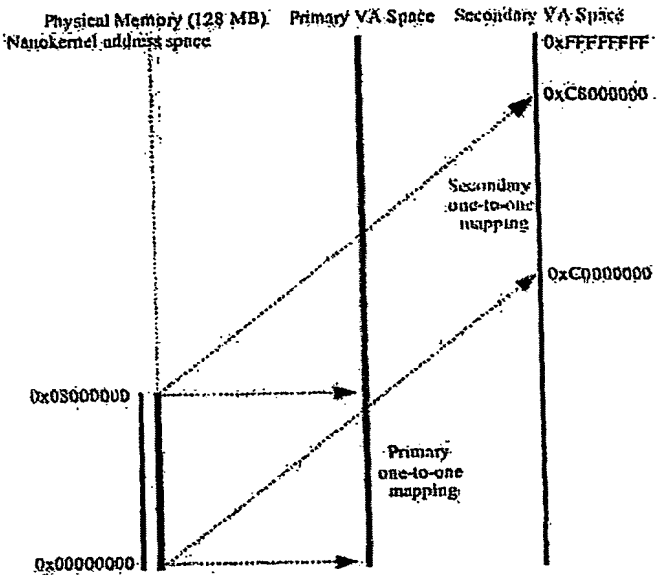

Physical Memory (128 MB)
NanoKernel address space
Primary VA Space
Secondary VA Space
0xFFFFFFFF
0xC8000000
Secondary one-to-one mapping
0xC0000000
0x08000000
Primary one-to-one mapping
0x00000000

FIG.10

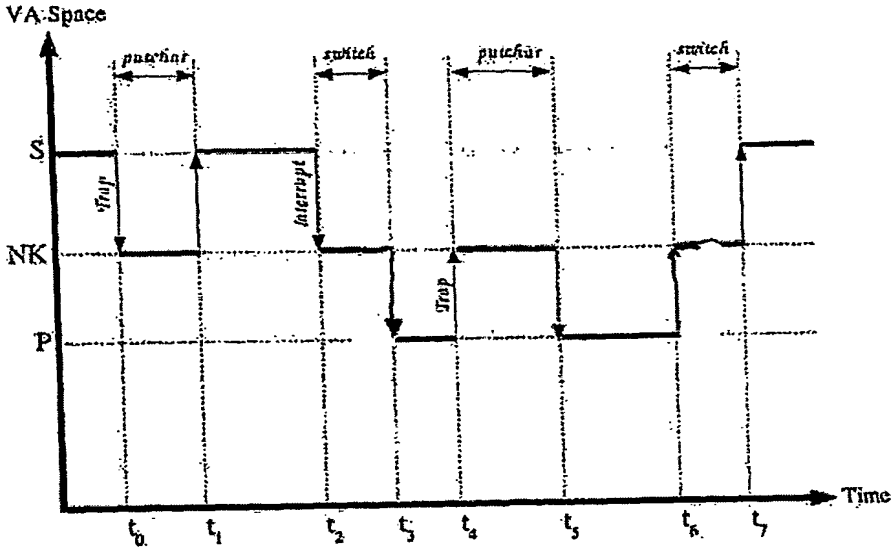


FIG 11

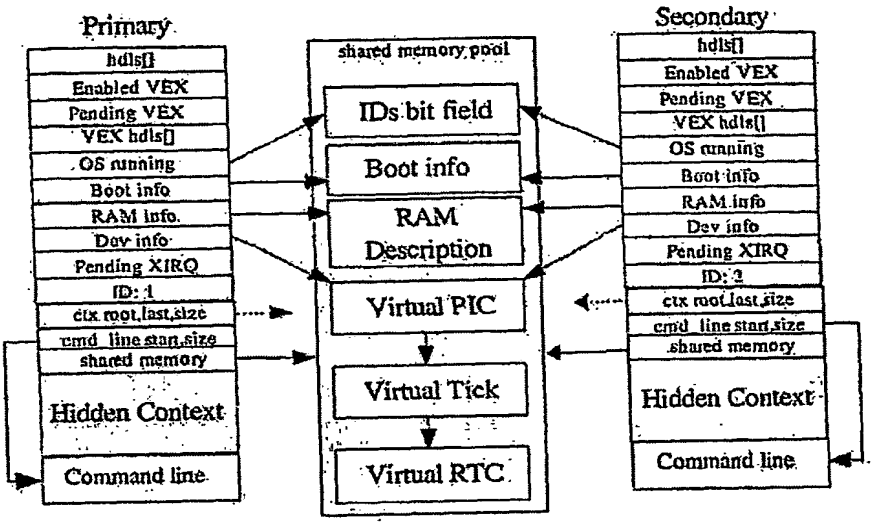

Primary
hdls[]
Enabled VEX
Pending VEX
VEX hdls[]
OS running
Boot info
RAM info
Dev info
Pending XIRQ
ID: 1
ctx root,last,size
cmd_line start,size
shared memory
Hidden Context
Command line
shared memory pool
IDs bit field
Boot info
RAM Description
Virtual PIC
Virtual Tick
Virtual RTC
Secondary
hdls[]
Enabled VEX
Pending VEX
VEX hdls[]
OS running
Boot info
RAM info
Dev info
Pending XIRQ
ID: 2
ctx root,last,size
cmd_line start,size
shared memory
Hidden Context
Command line

FIG. 12

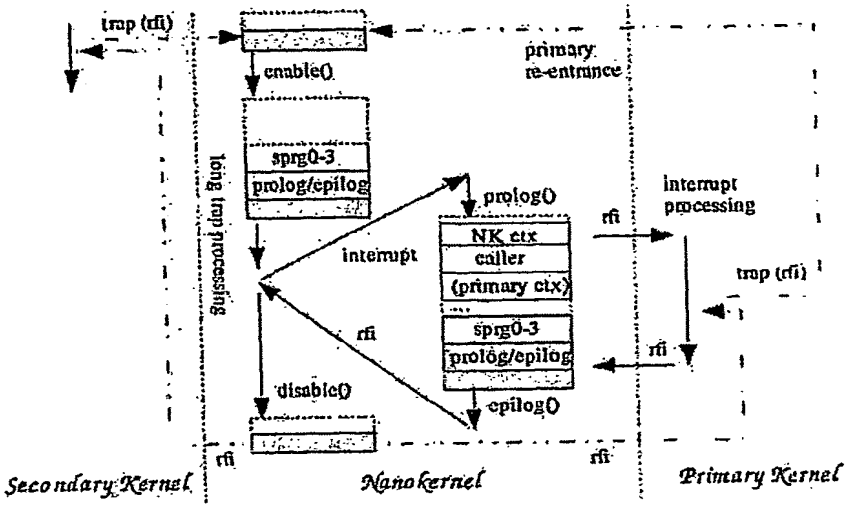

trap (rfi)
enable()
primary re-entrance
sprg0-3
prolog/epilog
long trap processing
prolog()
NK ctx
caller
(primary ctx)
sprg0-3
prolog/epilog
epilog()
interrupt
rfi
disable()
rfi
interrupt processing
rfi
trap (rfi)
rfi
rfi
rfi
Secondary Kernel
Nanokernel
Primary Kernel

FIG. 13